IBM 3330 Series Disk Storage 3333 Models 1 and 11 3330 Models 1, 2 and 11

Reference Summary

GX20-1920-1

Speed and Capacity

Access times:

Cylinder to cylinder	10 milliseconds
Average (entire pack)	30 milliseconds
Maximum	55 milliseconds

Data rate:

806 kilobytes per second (1.24 microseconds per byte)

Rotational delay:

Minimum	0 milliseconds
Average	8.4 milliseconds
Maximum	16.7 milliseconds

Capacity:

	3336 Model 1 Disk Pack*	3336 Model 11 Disk Pack**
Cylinders per pack	404 (plus 7 alternates)	808 (Plus 7 alternates)
Tracks per cylinder	19	19
Tracks per pack	7,809 (including 133 alternates)	15,485 (including 133 alternates)
Track capacity (bytes)	13,030	13,030
Cylinder capacity (bytes)	247,570	247,570
Pack capacity (approx. bytes)	100 million	200 million

*Used with 3330 Series Models 1 or 2
**Used with 3330 Series Model 11

Track Capacity

The number of records that can be recorded on a track depends on the record size. The following equation is used to determine the number of equal-length records per track. Home address and R0 space are accounted for by the equation and the capacity table.

$$\text{Number of equal-length records per track} = \frac{13{,}165 \quad \text{(track capacity)}}{135 + C + KL + DL \quad \text{(bytes per record)}}$$

where:

	KL	= key length
	DL	= data length
	C	= 0 when $KL = 0$
	C	= 56 when $KL \neq 0$

Use of Table

Some examples of how the capacity table may be used follow. In the table, "records" refers to physical records.

- Assume 140-byte logical records to be recorded unblocked (data length = 140) and without keys. The table indicates that 47 records can be placed on each track (893 on each cylinder, 360772 on each 3336 Model 1 pack and 721544 on each 3336 Model 11 pack). Reducing the record length by 1 byte permits 48 records per track, an increase of 7676 records per pack. Alternatively, the record length can be increased by 5 bytes without decreasing the number of records per pack.

- To see the effect of blocked records, assume the same 140-byte logical records are to be recorded without keys. Also assume a blocking factor of 20 (data length = 2800). The table indicates that 4 physical records can be written on each track for a total of 80 logical records per track (compared with 48 logical records if unblocked).

- Assume 100-byte logical records, unblocked, and formatted with keys (data length = 100, key length = 8). The number to look up in the "with keys" part of the table is 108 (key length + data length). There will be 44 records per track.

Capacity Table

| Bytes per Record | | | | | | Records Per | |
| Without Keys | | With Keys | | | | 3336 Model 1 | 3336 Model 11 |
Min	Max	Min	Max	Trk	Cylinder	Pack	Pack
6448	13030	6392	12974	1	19	7676	15352
4254	6447	4198	6391	2	38	15352	30704
3157	4253	3101	4197	3	57	23028	46056
2499	3156	2443	3100	4	76	30704	61408
2060	2498	2004	2442	5	95	38380	76760
1746	2059	1690	2003	6	114	46056	92112
1511	1745	1455	1689	7	133	53732	107464
1328	1510	1272	1454	8	152	61408	122816
1182	1327	1126	1271	9	171	69084	138168
1062	1181	1006	1125	10	190	76760	153520
963	1061	907	1005	11	209	84436	168872
878	962	822	906	12	228	92112	184224
806	877	750	821	13	247	99788	199576
743	805	687	749	14	266	107464	214928
688	742	632	686	15	285	115140	230280
640	687	584	631	16	304	122816	245632
597	639	541	583	17	323	130492	260984
558	596	502	540	18	342	138168	276336
524	557	468	501	19	361	145844	291688
492	523	436	467	20	380	153520	307040
464	491	408	435	21	399	161196	322392
438	463	382	407	22	418	168872	337744
414	437	358	381	23	437	176548	353096
392	413	336	357	24	456	184224	368448
372	391	316	335	25	475	191900	383800
353	371	297	315	26	494	199576	399152
336	352	280	296	27	513	207252	414504
319	335	263	279	28	532	214928	429856
304	318	248	262	29	551	222604	445208
290	303	234	247	30	570	230280	460560
277	289	221	233	31	589	237956	475912
264	276	208	220	32	608	245632	491264
253	263	197	207	33	627	253308	506616
242	252	186	196	34	646	260984	521968
231	241	175	185	35	665	268660	537320
221	230	165	174	36	684	276336	552672
212	220	156	164	37	703	284012	568024
203	211	147	155	38	722	291688	583376
195	202	139	146	39	741	299364	598728
187	194	131	138	40	760	307040	614080
179	186	123	130	41	779	314716	629432
172	178	116	122	42	798	322392	644784
165	171	109	115	43	817	330068	660136
158	164	102	108	44	836	337744	675488
152	157	96	101	45	855	345420	690840
146	151	90	95	46	874	353096	706192
140	145	84	89	47	893	360772	721544
134	139	78	83	48	912	368448	736896
129	133	73	77	49	931	376124	752248
124	128	68	72	50	950	383800	767600

Capacity Table (Contd)

| Bytes Per Record | | | | | | Records Per | |
| Without Keys | | With Keys | | | | 3336 Model 1 | 3336 Model 11 |
Min	Max	Min	Max	Trk	Cylinder	Pack	Pack
119	123	63	67	51	969	391476	782952
114	118	58	62	52	988	399152	798304
109	113	53	57	53	1007	406828	813656
105	108	49	52	54	1026	414504	829008
101	104	45	48	55	1045	422180	844360
96	100	40	44	56	1064	429856	859712
92	95	36	39	57	1083	437532	875064
89	91	33	35	58	1102	445208	890416
85	88	29	32	59	1121	452884	905768
81	84	25	28	60	1140	460560	921120
78	80	22	24	61	1159	468236	936472
74	77	18	21	62	1178	475912	951824
71	73	15	17	63	1197	483588	967176
68	70	12	14	64	1216	491264	982528
65	67	9	11	65	1235	498940	997880
62	64	6	8	66	1254	506616	1013232
59	61	3	5	67	1273	514292	1028584
56	58	2	2	68	1292	521968	1043936
54	55			69	1311	529644	1059288
51	53			70	1330	537320	1074640
48	50			71	1349	544996	1089992
46	47			72	1368	552672	1105344
43	45			73	1387	560348	1120696
41	42			74	1406	568024	1136048
39	40			75	1425	575700	1151400
36	38			76	1444	583376	1166752
34	35			77	1463	591052	1182104
32	33			78	1482	598728	1197456
30	31			79	1501	606404	1212808
28	29			80	1520	614080	1228160
26	27			81	1539	621756	1243512
24	25			82	1558	629432	1258864
22	23			83	1577	637108	1274216
20	21			84	1596	644784	1289568
19	19			85	1615	652460	1304920
17	18			86	1634	660136	1320272
15	16			87	1653	667812	1335624
13	14			88	1672	675488	1350976
12	12			89	1691	683164	1366328
10	11			90	1710	690840	1381680
9	9			91	1729	698516	1397032
7	8			92	1748	706192	1412384
6	6			93	1767	713868	1427736
4	5			94	1786	721544	1443088
3	3			95	1805	729220	1458440
1	2			96	1824	736896	1473792